NEBRASKA AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF NEBRASKA-LINCOLN
DEPARTMENT OF AGRONOMY AND HORTICULTURE

and

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, D. C.

RELEASE OF NE422T TRITICALE

NE422T is a forage winter triticale (*X.Triticosecale rimpaui* Wittm.) cultivar developed cooperatively by the Nebraska Agricultural Experiment Station and the USDA-ARS. It was jointly released in 2001 by the developing institutions. NE422T was selected from the cross Trical/UB-UW26 where Trical is most likely Trical 100 (a forage triticale developed by Resource Seed Inc., a subsidiary of Goldsmith Seed Company, Gilroy, CA) and UB-UW26 is an unknown winter triticale germplasm line given to the breeding program in the 1980s. NE422T is an F_3-derived F_4 line that was released primarily for its superior forage production in rainfed winter cereal production systems in Nebraska.

NE422T is an awned, white-glumed cultivar whose primary use will be as an annual forage crop. Its field appearance is most similar to 'Trical 100'. Kernels are red colored, elliptical, large, and slightly wrinkled (as is common with triticale). After heading, the canopy is moderately closed and upright. The flag leaf is recurved and not twisted at the boot stage. The foliage is green with a waxy bloom at anthesis. The peduncle is not pubescent. The spike is oblong in shape and middense. The glume is pubescent, tan, narrow, and midlong and the glume shoulder is wanting. The beak has an acuminate tip. The spike is usually nodding at maturity. Based on plump kernels, the kernel has no collar, a large brush of long length, rounded cheeks, large germ, and a narrow and deep crease.

NE422T was performance tested as NE96T422 in Nebraska grain yield nurseries starting in 1997 and in forage yield trials in 1997 and 1998. In two years of forage testing in Nebraska cultivar performance trials, NE422T has performed extremely well throughout most of Nebraska in rainfed production systems. The average Nebraska rainfed forage yield cut at the R2 (fully headed but the peduncle not fully emerged) to R4 (anthesis, Nebraska scale) of NE422T (6 environments) was 9070 kg/ha dry matter; with an average *in vitro* dry matter digestability of 63.9% and an average protein content of 9.0%. These data compare favorably with Newcale (a grain triticale: 8730 kg/ha, 67.9%, and 8.5%) and Trical 100 (8530 kg/ha; 63.5%, and 9.0%). For further comparison, the forage yields of NE422T were higher than two commonly grown wheat cultivars Arapahoe (7200 kg/ha, 67.7%, 8.5%) and Pronghorn (7930 kg/ah, 67.0%, 8.6%). The wheat cultivars are earlier than NE422T and were cut at the R4 to S0 (caryopsis visible, Nebraska scale). NE422T has a good grain yield (10 environments; 2790 kg/ha) for a forage triticale. The grain yield was higher than Trical 100 (2040 kg/ha), but lower than grain triticale cultivars (Presto, 3620 kg/ha; Newcale, 3120 kg/ha). For comparison, the grain yield of Arapahoe was 3050 kg/ha, which is lower than the grain triticale yields and might be explained by triticale yield nurseries generally be planted near, but earlier than the wheat yield trials. The main advantages of NE422T when compared to most other

forage triticale cultivars, within its area of adaptation, is its high forage yield coupled with a good grain yield (needed for efficient seed production) and its broad adaptation in rainfed production systems.

Other measurements of performance from comparison trials show that NE422T is late in maturity, about 7 days later than Newcale, 6 days later than Presto, 5 days later than Arapahoe, and 1 day earlier than Trical 100. The mature plant height of NE422T, a tall triticale (58 in; 148 cm) is 3 in (7.5 cm) taller than Trical 100, 12 in (31 cm) taller than Presto and Newcale, and 19 in (49 cm) taller than Arapahoe. NE422T has moderate straw strength for a tall, forage triticale. NE422T is slightly better than Trical 100 lodging, but worse than Presto, Newcale, and Arapahoe. The winter hardiness of NE422T would be consider as good, similar to Trical 100 which is one of the most winter hardy triticale cultivars currently available to grower, and comparable to an average winter wheat for this trait.

Based on field observations, NE422T is moderately resistant to the currently prevalent races of stem rust (caused by *Puccinia graminis Pers.: Pers. f. sp. tritici* Eriks & E. Henn; most likely containing *Sr31*) and leaf rust (caused by *P. triticina* Eriks.). Like most ryes and triticales, NE422T is moderately resistant to wheat streak mosaic virus. Ergot (*Claviceps purpurea* (Fr:Fr) Tul.) has not been found in the cultivar when the disease was present in the other triticales under similar growing conditions. NE422T has an average grain volume weight for triticale.

In positioning NE422T, based on performance data to date, it should be well adapted to most rainfed winter annual forage production systems, with high forage yield potential in most of Nebraska. It should also perform well as a second crop in irrigated productions, where NE422T in planted following a harvested summer annual crop and the forage is harvested the following year before planting another annual summer crop. In these cropping systems, water would not be limiting and three crops could be harvested in two years. It should perform well in similar growing areas in adjacent states.

NE422T has been uniform and stable since 1999. Less than 0.5 % of the plants were rogued from the Breeder's seed increase in 1999. The rogued variant plants were taller in height (10 - 20 cm, 1:10,000 plants), or were shorter in height (25 to 30 cm) and later in maturity (3 to 4 d later, 1:8000 plants). Up to 1% (10:1000) variant plants may be encountered in subsequent generations. The Nebraska Foundation Seed Division, Department of Agronomy, University of Nebraska-Lincoln, Lincoln, NE 68583 had NE422T foundation seed available to qualified certified seed enterprises in 2000. The U.S. Department of Agriculture will not have seed for distribution. The seed classes will be Breeder, Foundation, Registered, and Certified. The Registered seed class will be a nonsalable seed class. NE422T will be submitted for registration and plant variety protection under P. L. 10577 with the certification option. A research and development fee will be assessed on certified seed sales.

Development Team: P. S. Baenziger and K. P. Vogel

Approval

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Director, Nebraska Agricultural Experiment Station — date

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Administrator, Agricultural Research Service — date
United States Department of Agriculture
Washington, D. C.